REMARKS

[0001] The following paragraphs are numbered for ease of future reference. Claims 1-2, 4-11, 13-17, 19-24 and 26-27 are all the claims presently pending in this application. Claims 1-2, 5, 7-11, 15-17 and 21-24 have been amended to more particularly define the claimed invention.

[0002] Applicant further respectfully submits that no new matter is added to the currently amended claims, nor has the scope of the pending claims changed. Applicant respectfully traverses the rejections based on the following discussion.

I. REJECTION UNDER 35 U.S.C. §101

[0003] Claims 1-7 have been rejected under 35 U.S.C. §101 as being directed toward non-statutory subject matter.

[0004] Applicant's amendment, "*assigning, by said computing device, by each successive linear programming model, a range of said backorder costs...*," satisfies the two corollaries of the "**machine-or-transformation**" test of *In re Bilsky*, since the amendment: 1) is not merely field-of-use limitation by imposing meaningful limits on the method claim's scope; and 2) does not merely add insignificant extra-solution activity by reciting a specific machine or a particular transformation of a specific article in an insignificant step, such a data gathering or outputting. See *In re Bilski*, 545 F.3d 943, 88 USPQ2d 1385 (Fed. Cir. 2008). In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

II. OBJECTION TO THE CLAIMS

[0005] Claims 1, 7-10, 15-16, 21 and 23 is/are objected to due to informalities and Applicant has amended the claims in a manner believed fully responsive to all points raised by the Examiner.

[0006] In response to the Examiner's objected to Applicant's claimed, "*allocating,…to different prioritized demands*," Applicant has amended every occurrence of "*allocating…demands*," to "*assigning…resources to different customers having prioritized customer demands*…." Applicant points out that the Examiner's objection to the term, "consistent with," was erroneously applied to independent claim 1, (probably from a previous rejection), since the term no longer appears in claim 1.

[0007] With respect to the Examiner's objection to the language, "for each iteration," of claim 9, Applicant has amended the claim to recite, "*a different linear programming model for each repetition of said process of assigning remaining resources*."

[0008] With respect to the Examiner's objection to the language, that a "each different linear programming model uses as ~~a starting point~~ a program solution," Applicant has amended the claims 10, 16 and 23 to recite, "*each different linear programming model uses as an initial constraint a program solution*." Applicant also directs the Examiner's attention to Applicant's Specification, to clarify the Examiner's questions about the meaning of Applicant's claimed term, "*solution*" with respect to a linear program. *See, e.g.*, paragraph [0021], "A LP is composed of an objective function that defines a measure of the quality of a given solution, and a set of linear constraints," paragraph [0138], "The previous (aggregated) solution can be used to provide a feasible starting solution for reoptimizing the LP with the additional disaggregated constraints…Once the revised solution to the disaggregated LP is determined, the F and B variables for the current demand class are fixed to their current values, the next demand class is disaggregated, solved, and so on. This is carried out until all demand classes have been considered."

[0009] In view of the foregoing, the Examiner is respectfully requested to reconsider and

withdraw these objections.

III. REJECTION UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

[0010] Claims 1, 5, 7-8, 10, 15-16, 21 and 23 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Claims 1, 5, 7-8, 10, 15-16, 21 and 23 have been amended in a manner believed fully responsive to all points raised by the Examiner.

[0011] More specifically, with respect to the rejection of claims 1, 7, 8, 15 and 21, Applicant has amended every occurrence of "*allocating...demands*," to "*assigning...resources to different customers having prioritized customer demands*...," as stated in the above section.

[0012] With respect to claim 5, Applicant has amended the claim to recite, "*to ensure that solutions to subsequent iterations are equal to previous solutions*."

[0013] With respect to claims 10, 16 and 23, Applicant has amended the claims 10, 16 and 23 to recite, "*each different linear programming model uses as an initial constraint a program solution*," as stated in the above section.

[0014] In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

IV. THE PRIOR ART REJECTIONS

A. The 35 U.S.C. § 103(a) Rejection over Hegde further in view of de Farias and Fakhouri

[0015] Claims 1-2, 5-6, 8-9, 15 and 21-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hegde, et al., U.S. Pat. No. 7197469, (hereinafter "Hegde"), further in view of de Farias, "The Linear Programming Approach To Approximate Dynamic Programming: Theory

And Application", (hereinafter "de Farias"), and further in view of Fakhouri, et al., U.S. Pat. No. 746147, (hereinafter "Fakhouri").

[0016] The Examiner alleges that one of ordinary skill in the art would have been motivated to modify Hegde with the teaching from de Farias and Fakhouri to form the invention of claims 1-2, 5-6, 8-9, 15 and 21-22. Applicant submits, however that these references would not have been combined and even if combined, the combination would not teach or suggest each element of the claimed invention.

[0017] Applicant traverses the Examiner's rejection since, among other reasons, Hegde is directed toward dividing each of a priority ranked scheduled releases (Material Requirements Planning (MRP)) into "N" separate and smaller sized scheduled releases where the priority of each of the "N" releases may be equal to the priority of the original release. The "N" separate and smaller sized scheduled releases are sorted according to priority and then used to determine an optimal supply schedule for allocating resources including component supply and assembly capacity. The de Farias publication is directed toward applications of approximate linear programming to queuing problems and web server farm management. Fakhouri is directed toward a method of managing a cluster of networked resources and resource groups using rule-based constraints.

[0018] Meanwhile, Applicant's claimed invention is directed toward determining each iterative solution for remaining ones of the plurality of sets of prioritized customer demands using results from a previous mathematical linear program solution and outputting the production plan based on optimizing the each mathematical linear program and determining each iterative solution.

[0019] More specifically, Applicant submits, that neither Hegde, de Farias, nor Fakhouri, nor any alleged combination thereof, teaches or suggests:

"*determining, by said computing device, each iterative solution for remaining ones of said plurality of sets of prioritized customer demands using results from a previous mathematical linear program solution*," and "*outputting, by said computing device, said production plan based on optimizing said each mathematical linear program and determining each iterative solution*," according to Applicant's independent claim 1, and

"*assigning, by said computing device, remaining resources to the next highest priority group of prioritized customer demands using a second linear programming model, wherein said second linear programming model uses results from said first linear programming model*,"

"*repeating said process of assigning remaining resources, by said computing device, to the remaining groups of prioritized customer demands in order of priority, wherein each subsequent linear programming model uses results from a previous linear programming model,*" and

"*outputting, by said computing device, a production plan based said processes of assigning resources*," according to Applicant's independent claim 8, and similarly, independent claims 15 and 21.

[0020] With respect to Applicant's independent claim 1, the Examiner alleges that Hegde discloses Applicant's claimed invention of, "*determining, by said computing device, each iterative solution for remaining ones of said plurality of sets of prioritized customer demands using results from a previous mathematical linear program solution*," in that "(Hegde [abstract] teaches a system and method "for the optimal allocation of supply and capacity over time that satisfy two key requirements (a) being consistent with accepted operational objectives (e.g. low inventory, short lead times, prioritized allocation of supply and capacity) […]" (emphasis added) where the consistency is with the previous allocation hence consistent with the previous

solution."

[0021] However, Hegde merely disclose in this statement in the Abstract that the "optimal allocation of supply and capacity over time must achieve predefined operational objectives, one of which may be "the prioritized allocation of supply and capacity." Nowhere does Hegde teach or suggest the "prioritized allocation of supply and capacity" is equated with:

1) a "previous allocation…consistent with the previous solution," as alleged by the Examiner; or

2) determining an iterative solution for remaining ones of plurality of sets of prioritized customer demands using results from a previous mathematical linear program solution per Applicant's claimed invention.

[0022] The Examiner has no basis for this erroneous position in both the reference and what one of ordinary skill in the art at the time of the invention to equate a "prioritized allocation of supply and capacity" to "a previous allocation." Hegde's disclosure is merely stating that allocation based on "prioritized allocation of supply and capacity" is an "accepted operational objective," NOT that "allocation of supply and demand" is based on, or "consistent with" a previous allocation. Accepted operational objectives are NOT equivalent to a previous allocation of supply and demand – they are merely initial objectives, and certainly not "*results from a previous mathematical linear program solution*," per Applicant's claimed invention.

[0023] Accordingly, Hedge fails to teach or suggest Applicant's claimed invention of, "*outputting…said production plan based on optimizing said each mathematical linear program and determining each iterative solution*," since Hegde fails to teach or suggest "*using results from a previous mathematical linear program solution*," as argued above by Applicant.

Furthermore, the Examiner alleges that "Hegde [abstract] refers to a feasible production

schedule, and in [11,13] refers to an output of the production scheduling system. Hegde in [4,8] refers to use of linear programming techniques which are used to compute the production plan)". Although Hegde discloses, "The production scheduling system which incorporates LP in generating material releases to account for binning and material substitutions," at column 4, lines 9-11, Hegde fails to teach or suggest "*outputting...said production plan based on optimizing said each mathematical linear program and determining each iterative solution*," "*for remaining ones of said plurality of sets of prioritized customer demands using results from a previous mathematical linear program solution*." Hegde does not give any more detail on the production schedule other than that it "incorporates LP" in generating material releases.

[0024] Therefore, with respect to Applicant's independent claim 1, Applicant respectfully request that the Examiner reconsider and withdrawn the rejection over Hegde.

[0025] With respect to Applicant's independent claims 8, 15 and 21, the Examiner admits that "Hegde does not specifically teach

"aggregating, by said computing device, said prioritized demands into different priority groups;

allocating, by said computing device, said resources to the highest priority group of prioritized demands using a first linear programming model;

allocating, by said computing device, remaining resources to the next highest priority group of prioritized demands using a second linear programming model, wherein said second linear programming model uses results from said first linear programming model; and

repeating said process of allocating remaining resources, by said computing device, to the remaining groups of prioritized demands in order of priority."

[0026] However, the Examiner alleges "de Farias, in an analogous art, does and teaches use of

"approximate dynamic programming" wherein problems are segregated into stages (de Farias [p.98] refers to priorities wherein priority levels serve as stages) that are solved iteratively by linear programming problem formulations. de Farias [2003] [p.857] also refers to the "outcome of the approximate LP" which corresponds to outputting ... and on [p.860] inter alia states "The first example illustrates how state-relevance weights influence the solution of the approximate LP.", and further displays an example of such solution."

[0027] Applicant's contend that nowhere in any of the above-recited passages to de Farias (2002) and de Farias (2003), is there any teaching or suggestion of "*assigning, by said computing device, remaining resources to the next highest priority group of prioritized customer demands using a second linear programming model, wherein said second linear programming model uses results from said first linear programming model*," and "*repeating said process of assigning remaining resources, by said computing device, to the remaining groups of prioritized customer demands in order of priority, wherein each subsequent linear programming model uses results from a previous linear programming model*."

[0028] Page 98 of De Farias 2002 merely discloses a comparison between other heuristics (LONGEST, FIFO and LBFS) with that of the approximate linear program, ($\xi = 0.95$) as shown in Table 6.1. The third full paragraph states in full:

> We can compare the average cost obtained by the greedy policy with respect to the solution of the approximate LP with that of several different heuristics, namely, firstin- first-out (FIFO), last-buffer-first-served (LBFS), and a policy that always serves the longest queue (LONGEST). LBFS serves the job that is closest to leaving the system; hence priority is given to jobs in queues 2 and 4. Results are summarized in Table 6.1 and we can see that the approximate LP yields significantly better performance than all of the other heuristics.

[0029] Thus the phrase Examiner relies on to allegedly disclose Applicant's claimed inveniton, "priority is given to jobs in queues 2 and 4," has NOTHING to do with an "approximate LP," but

rather is a continuation of the parameters of LBFS.

[0030] The passage at page 857 of de Farias (2003) that the Examiner allegedly equates with "outputting," is as follows:

> One would hope that $||J^* - \Phi \check{r}||_{1,c}$ with $\check{r}$ being an outcome of the approximate LP, would be similarly uniformly bounded over N.

[0031] However, the above passage merely recites, "an outcome" of a LP, NOT "outputting" a solution of an LP, or for that matter, *using a result from a previous linear programming model in subsequent linear programming model*, per Applicant's claimed invention.

[0032] Furthermore, the passage at page 860 of de Farias (2003) that the Examiner allegedly equates with "further displays an example of such solution," is as follows:

> The first example illustrates how state-relevance weights influence the solution of the approximate LP.

[0033] This citation refers to the subsequent section 6.1 "Single Queue with Controlled Service Rate," as "the first example." Applicant cannot determine what relevance the Examiner alleges this passage has to the claimed invention, since nowhere in this passage or anywhere else for that matter in de Farias (2002 or 2003) is there any teaching or suggestion of "*repeating said process of assigning remaining resources, by said computing device, to the remaining groups of prioritized customer demands in order of priority, wherein each subsequent linear programming model uses results from a previous linear programming model*," per Applicant's claimed invention.

[0034] Since neither de Farias reference teaches or suggests assigning remaining resources where "*each subsequent linear programming model uses results from a previous linear programming model*," thus, *ispo facto*, neither de Farias reference teaches or suggests suggests, "*outputting...a production plan based said processes of assigning resources*," according to

Applicant's independent claim 8, and similarly, independent claims 15 and 21.

[0035] With respect to independent claim 1, the Examiner admits on the bottom of page 10 of the Non-Final Office Action that "Neither Hegde nor de Farias specifically teach that allocations are made based on demand priorities, or independently determining backorder costs penalties for each set of prioritized demands using said computing device."

[0036] The Examiner alleges that "Fakhouri [29,23] states "In such environments, multiple independent decision support systems can co-exist in a cooperative and/or hierarchical manner." (emphasis added). Fakhouri [38,36] inter alia states "In brief, we obtain an integer solution by solving a linear relaxation of the ILP described above, and then heuristically converting the optimal factional solution to obtain an integer solution. Having obtained an optimal fractional solution, we convert it into an integer solution in stages, at each stage "fixing" the values of variables that have been rounded in previous stages. We tackle lower-level resource before those that depend on them. In every iteration, we identify a few resources and their associated variables. We apply the integrality constraint for those variables to obtain an ILP with a relatively small number of integrality constraints. We solve this ILP, extract the values of the selected variables from the solution, and fix those values for their respective variables for all subsequent iterations. We continue this process till we arrive at a fully integral solution."

[0037] The Examiner then admits that "[n]either Hegde nor Fakhouri specifically refer to backorder penalty costs…," but alleges that Leachman discloses, "Cash flows in the objective function include the sales revenue of each finished goods type (forecast demands case), backorder costs for supply that is delivered late (order-board demands case), inventory holding costs for excess bin output, and the incremental cost of producing additional source product."

[0038] However, neither Hegde, de Farias nor Fakhouri discloses Applicant's claimed,

"*independently determining backorder costs penalties for each set of prioritized customer demands using said computing device*," and "*assigning, by said computing device, by each successive linear programming model, a range of said backorder costs within a priority group to which resources are currently being assigned*," of independent claim 1, and "*wherein during said assigning processes, each linear programming model assigns a range of backorder costs within the priority group to which the resources are currently being assigned*," of independent claims 8, 15 and 22.

[0039] Nowhere in the combined references is there any disclosure, and nowhere does the Examiner specifically address determining backorder cost penalties…*for each set of prioritized demands*. Additionally, nowhere in the combined references is there any disclosure of an allocation of a range of backorder costs within a priority group, wherein that priority group has *resources that are currently being allocated*.

[0040] In summary, Hegde is directed toward dividing each of a priority ranked scheduled releases (Material Requirements Planning (MRP)) into "N" separate and smaller sized scheduled releases where the priority of each of the "N" releases may be equal to the priority of the original release. The "N" separate and smaller sized scheduled releases are sorted according to priority and then used to determine an optimal supply schedule for allocating resources including component supply and assembly capacity. The de Farias publication is directed toward applications of approximate linear programming to queuing problems and web server farm management. Fakhouri is directed toward a method of managing a cluster of networked resources and resource groups using rule-based constraints.

[0041] Meanwhile, Applicant's claimed invention is directed toward determining each iterative solution for remaining ones of the plurality of sets of prioritized customer demands using results

from a previous mathematical linear program solution and outputting the production plan based on optimizing the each mathematical linear program and determining each iterative solution.

[0042] Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection since the alleged prior art references to Hegde, de Farias and Fakhouri, (either alone or in combination) fail to teach or suggest each element and feature of Applicant's claimed invention.

B. The 35 U.S.C. § 103(a) Rejection over Hegde further in view of de Farias, Fakhouri and Leachman

[0043] Claims 4, 7, 10-11, 13-14, 16-17, 19-20, 23-24 and 26-27 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hegde, further in view of de Farias, Fakhouri and Leachman, et al., "IMPReSS: An Automated Production-Planning and Delivery-Quotation System at Harris Corporation-Semiconductor Sector", (hereinafter "Leachman").

[0044] The Examiner alleges that one of ordinary skill in the art would have been motivated to modify Hegde with the teaching from de Farias, Fakhouri and Leachman to form the invention of claims 4, 7, 10-11, 13-14, 16-17, 19-20, 23-24 and 26-27. Applicant submits, however that these references would not have been combined and even if combined, the combination would not teach or suggest each element of the claimed invention.

[0045] However, even assuming *arguendo* that the Examiner's position has some merit, Leachman fails to teach or suggest:

"*determining, by said computing device, each iterative solution for remaining ones of said plurality of sets of prioritized customer demands using results from a previous mathematical linear program solution*," and "*outputting, by said computing device, said production plan based*

on optimizing said each mathematical linear program and determining each iterative solution," according to Applicant's independent claim 1, and

"*assigning, by said computing device, remaining resources to the next highest priority group of prioritized customer demands using a second linear programming model, wherein said second linear programming model uses results from said first linear programming model*,"

"*repeating said process of assigning remaining resources, by said computing device, to the remaining groups of prioritized customer demands in order of priority, wherein each subsequent linear programming model uses results from a previous linear programming model,*" and

"*outputting, by said computing device, a production plan based said processes of assigning resources*," according to Applicant's independent claim 8, and similarly, independent claims 15 and 21. Therefore, Leachman fails to overcome the deficiencies of Hegde, de Farias, and Fakhouri.

[0046] Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection since the alleged prior art references to Hegde and de Farias, Fakhouri and Leachman (either alone or in combination) fail to teach or suggest each element and feature of Applicant's claimed invention.

V. FORMAL MATTERS AND CONCLUSION

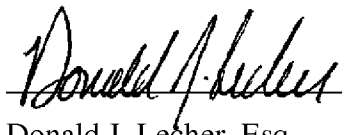
In view of the foregoing, Applicant submits that claims 1-2, 4-11, 13-17, 19-24 and 26-27, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Assignee's Deposit Account No. 09-0456.

Respectfully Submitted,

Date: February 2, 2010



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